

PRELIMINARY RESULTS
GILT EDGE DISTRICT MAPPING
NOVEMBER 1987 - AUGUST 1988

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PRELIMINARY RESULTS
GILT EDGE DISTRICT MAPPING
AND
GENERATIVE EXPLORATION PROJECT
LAWRENCE COUNTY, SOUTH DAKOTA

NOVEMBER 1987 - AUGUST 1988

REPORT PREPARED FOR
BROHM MINING CO.
DEADWOOD, SOUTH DAKOTA

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In Pocket

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This report summarizes preliminary results of geologic mapping and generative exploration carried out on Brohm Mining Co. properties in the Gilt Edge district in 1987-1988. A set of geologic maps at scale of 200 feet to the inch and a compilation at 500 feet to the inch have been produced.

Bulk tonnage, gold mineralization at Gilt Edge is closely associated with emplacement and evolution of an alkalalic hypabyssal igneous complex. Gold-bearing hydrothermal ore fluids are orthomagmatic and evolved from crystallization of a sulfide-bearing trachyte (latite) porphyry. Ore fluids continued to circulate during emplacement of slightly younger quartz eye trachyte porphyries. Mineralization was emplaced in structures and reactive host rocks. Favorable locations for disseminated ores are: tabular breccia zones and fractured wallrocks at margins of the quartz eye trachyte porphyry plugs, quartzite units of the lower member and carbonate-rich units in the middle member of the Deadwood formation; and along the margins of steep faults and fissures that serve as hydrothermal conduits.

Principal additions to ore reserves at Gilt Edge will come from systematic exploration and development drilling beneath the leach pad and plant site, and on the southeast margin of Anchor Hill.

A second potentially ore-bearing igneous-hydrothermal center is identified west of Two Bit Gulch in the west 1/2 of section 36 and north 1/2 of section 1. Systematic soil sampling on a grid with analyses for gold and arsenic should be done in this area to help define near surface ore targets. Land acquisition activities in this area should continue.

Quartzite and carbonate units of the Deadwood formation mineralized with gold, sulfides and silica are found at the surface south of the El Refugio mine in the NE 1/4 of section 4. Potential exists for defining one to two million tons of near surface ore in this area. Detailed mapping and sampling of trenches, cuts and outcrops in this area is recommended. Land acquisition should continue.

A speculative low priority target for concealed replacement gold ore is centered in section 6, one to two thousand feet west of Anchor Hill. Weak pervasive hydrothermal alteration, sulfide mineralization and measureable gold values along steep structures suggest favorable host beds of the concealed Deadwood formation may be mineralized. This possible target should be tested when condemnation drilling for the sulfide project plant site is done in this area.

Detailed mapping at 200 feet to the inch should continue thru the area now mapped at 500 feet to the inch.

INTRODUCTION

A program of geologic mapping, prospecting and evaluation of mineral potential on lands controlled by Brohm Mining Co. in the Gilt Edge District, South Dakota was initiated in November 1987. Principal objectives of this effort are to establish a geologic data base to assist in land acquisition activities and to provide basic information to help plan and interpret data for permitting activities. Another important objective is to identify and evaluate mineralization and define possible ore targets on land controlled by Brohm Mining Co. A third objective is to identify and define principal ore controls and use this information to aid in identification of potential ore targets.

Tom C. Patton carried out part of the mapping activities in November-December 1987. Richard Nielsen carried out the mapping activities in November-December 1987 and May to June 1988. Field data are posted on geologic maps at 1" to 200' and 1" to 500 feet. Geochemical data sheets are attached in an appendix. This report summarizes our principal conclusions and recommendations.

WORK DONE

A geologic map is prepared for the area covered by property controlled by Brohm Mining Co. We attempted to identify and evaluate all mineralization or potential mineralization on the property. Special effort was made to identify and map structures, alteration halo effects to mineralization, and favorable igneous and sedimentary host rocks.

More than 200 rock chip samples of mineralized material were collected and assayed for gold, silver, arsenic, fluorine and, in some cases, for copper, lead and zinc.

Geologic mapping done in November and December is posted and compiled on a topographic base at a scale of 500 feet to the inch which is an enlargement of the USGS Deadwood South 7.5' quad map. Mapping completed in May-June 1988 was compiled on a new topographic base at 200 feet to the inch scale prepared March 1988 for Minproc by Intermountain Aerial Surveys of Salt Lake City. One task that remains to be done is compilation of all geologic mapping onto a single topographic base.

Owing to extensive nature of forest and soil cover and general lack of natural outcrops, our geologic maps are designed as outcrop maps and show outcrop control by bright or intense color. Inferred rock types are shown by pale color shading.

Location of all geochemical samples are posted on the 500-scale geologic map or on mylar overlays to the 200-scale geologic maps. Geochemical data collected by AMOCO also are plotted on the overlays. Map coordinates of samples, description of the material and analytical results are attached in an appendix to this report.

PRINCIPAL RESULTS

Precambrian Metamorphic Rocks

Precambrian rocks are not widely exposed in the map area. Extensive outcrops are present near the village of Galena at the mouths of Butcher Gulch and Ruby Gulch. Outcrops also are present along Strawberry Creek in Boomer Gulch, and along the paved highway west of Strawberry Ridge. A small outcrop was mapped near the center of section 31.

Quartz-muscovite biotite schists and amphibolite are the predominant rock types in the Gilt Edge area. A little greenstone is present and a conspicuous banded meta chert in the Hoodoo and Strawberry Creek areas appears to be isoclinally folded.

These Precambrian rocks are not a good host for disseminated gold mineralization. Extensive and widespread mineralization in Cambrian Deadwood formation and trachyte porphyry in the Hoodoo area and in upper Strawberry Creeks dies out in a very short distance within adjacent Precambrian schists. This feature appears confirmed in drill holes where ore grade gold mineralization appears confined to narrow structure-controlled areas within the Precambrian rocks.

The siliceous meta chert appears to be unmineralized. Rock chip samples collected from this unit show no detectable gold values.

Approximately 30 million ounces of gold has been produced from Precambrian rocks at Lead, about four miles west of the Gilt Edtge district. All lode gold produced has come from the carbonate facies iron formation and related rocks of the Archean Homestake formation.

We checked detailed geologic maps of Darton and Paige (1925), Paige (1924) and Noble and others (1949) to determine if the ore bearing horizon at Homestake may lie concealed beneath Tertiary igneous rocks at Gilt Edge.

Regional foliation in the Homestake formation strikes north to north-northwest. It is complexly folded into nappe-like recumbent folds. Most likely projection of the formation into areas where the unit may be concealed by younger rocks is to the north of Lead into the area at the headwaters of City Creek, one to two miles north-northeast of Central City (see attached map).

Chances of Homestake formation being present beneath Tertiary igneous rocks on Brohm property at Gilt Edge are very, very remote. The schists and amphibolites present at Gilt Edge are believed to be part of a completely different Precambrian sequence than that containing the Homestake formation. Precambrian rocks at Gilt Edge are considered to be a relatively young sequence that rests unconformably upon the Homestake formation. I believe that Homestake formation is not present on Brohm property and the interest in the area expressed by Homestake Mining Company is for an exploration play within the Deadwood or Tertiary igneous host rocks.

Cambrian Deadwood Formation

A continuous complete stratigraphic section is not present on the Brohm property. Strata of this formation are highly disturbed and injected by Tertiary igneous sills and dikes.

Based upon work by Darton and Paige (1925) on the type section at Deadwood, modified by Gries (1952), Butler and others (1955) and Mukherjee (1968), the Deadwood formation is about 400 to 500 feet thick and may be divided into three informal members. A lower member consists of hematitic quartz pebble conglomerate and hematitic sandstone overlain by quartzitic sandstone. This lower sandy member is about 40 feet thick and is a host for veinlet or stockworks-type disseminated gold mineralization in the Gilt Edge area. A middle member consists of sandy shale, buff to gray dolomitic limestones, limestone conglomerates and greenish gray shale. The middle member may be up to 250 feet thick and carbonate layers are host for gold-bearing replacement sulfide mineralization at Gilt Edge. The green-gray shale beds of this member generally shows little alteration or mineralization. An upper sandy member is up to 140 feet thick and consists of well bedded dolomitic sandstone with green shale partings. This unit is host for contact replacement ore at Gilt Edge.

Certain specific stratigraphic horizons are preferred location of Tertiary intrusive sills. The basal contact of the formation is the location of major laccolithic intrusions in the Gilt Edge mine area and in the area west of Two Bit Gulch. Porphyry sills have intruded the dolomitic middle and upper members.

We speculate that rock-types especially suitable for disseminated bulk tonnage gold mineralization are the relatively permeable vuggy hematitic sandstones of the lower sandy member. Hypogene ore fluids entering these beds would be oxidized by relatively oxidized formation waters in chemical equilibrium with hematite and destabilize the Au-bisulfide complex, precipitating gold. Exploration drilling by Utah International in the Spruce Gulch area 1986 showed favorable units for gold mineralization are the lower hematitic quartz sandstone and upper dolomitic sandstone units.

Ordovician Sediments

A relatively thin, 10-15 foot thick bed of scolithus sandstone is mapped in the SW 1/4 of section 35 where it is overlain by 60 to 70 feet of greenish gray, thinly laminated shale. These two units are considered to be the Ordovician units.

These units may also be present on Bear Den Mountain in section 33. The Cambrian Deadwood formation in this area is mapped as 500 feet thick. Part of this apparent anomalous and excessive thickness probably is the Ordovician formations. Outcrops are rare on forest-covered Bear Den Mountain and we did not recognize the Ordovician units here.

The scolithus sandstone west of Two Bit Gulch in the northwest corner of the map area is mineralized and altered. Rock chip samples gave 0.023 opt gold. The overlying Ordovician shale is unaltered and unmineralized.

Mississippian Pahasapa Formation

Buff domomitic limestone of the Ordovician Englewood limestone was not differentiated from the buff to gray limestones of the Pahasapa formation. Both units probably are present in the limestones at the crest of Bear Den Mountain. Both units are unmineralized in the map area.

Tertiary Gilt Edge Igneous Complex

Gold mineralization is closely associated with evolution and emplacement of the alkalic hypabyssal intrusions of the complex. Several pulses of intrusions are represented and hydrothermal emplacement of gold mineralization occurred late in the sequence.

Igneous activity in the district began with emplacement of hornblende trachyte sills from feeders located north of the Golden Crest mine and west of Anchor Hill. Fault displacements then became active, probably associated with emplacement of viscous polymerized magmas into the Paleozoic sedimentary cover. A complex of dikes and plugs of coarsely porphyritic trachyte porphyry was emplaced north of the Gilt Edge area, centered on vents in the Dome Mountain area. Two volatile-rich laccolithic quartz-bearing trachyte porphyry plutons next were emplaced. One is centered in the Gilt Edge mine area, the other in the headwaters of Spruce Gulch, north of Monarch mine. Emplacement of laccoliths was followed closely by intrusion of related quartz-rich quartz trachyte porphyry plugs and associated breccias in the Gilt Edge area and near the Monarch mine. Hydrothermal introduction of gold mineralization overlaps the last two igneous events. The final major igneous event was extrusion of an aphyric rhyolite flow in the Butcher and Ruby Gulch area.

Further details on each igneous event are given below.

Hornblende Trachyte Porphyry Sills. This unit is exposed throughout the map area and is the most widespread igneous rock of the Gilt Edge igneous complex. We recognize that several individual sills and one or two composite layered sills are present and all have been lumped together into a single map unit. Thin sills generally are porphyritic aphanitic with sparse hornblende phenocrysts in a fine gray aphanitic matrix. Relatively thick sills are porphyritic microgranitic with prominent hornblende phenocrysts and/or prominent feldspar phenocrysts in fine granular matrix. The point is that a group of multiple intrusive sills are represented by the map unit and all are roughly the same composition. That composition probably is trachyandesitic. The injected magma was fluid and spread out as sills over a large area. These widespread sills are mapped as hornblende diorite porphyry by Mukherjee (1968).

Several layers or strata in the Deadwood formation are favored as locations for sills. Most sills are emplaced in the middle member of the Deadwood, usually above the lower quartzite and at various levels within the middle member. At least one or two sills are emplaced in the upper dolomitic sandstone member of the Deadwood formation.

Hornblende trachyte porphyry sills attain greatest aggregate thickness west of Anchor Hill and north of Golden Crest mine in section 6. We infer the feeders for the sills are in this area. Indeed, we mapped three small plugs or stocks of equigranular fine-grained syenodiorite in this area and we infer these plugs fill the feeder vents for the sills. One plug is located about 2000 feet north of the Golden Crest mine in the NW 1/4, SW 1/4 of section 6, one other is located about 3000 feet north-northeast of the Golden Crest mine near the center of section 6, and a third is located 800 feet east of Anchor Hill. These intrusions are mapped as pyroxene diorite and pyroxene andesite porphyry by Mukherjee (1968).

The sills are commonly altered and weakly mineralized adjacent to fault structures and pervasively altered in and around the Gilt Edge mineralized system. This alteration is of a propylitic type and is manifest by replacement of hornblende by chlorite and pyrite. The groundmass is bleached and contains a little carbonate, clay and sericite. In weathered outcrops the chlorite is argillized and the groundmass is bleached and fractures are coated with goethite. This rock becomes slightly bleached, pyritized and altered to clay, sericite and possibly alunite in the strongly mineralized zone in and around the Gilt Edge ore bodies.

Mukherjee reports an age date of 60.5 m.y. on relatively fresh hornblende diorite porphyry. This age date places a maximum age on the emplacement of mineralization.

Trachyte Porphyry. This is a field name for strikingly porphyritic dikes and small plugs that are widespread in the northern part of the map area. These small intrusions are particularly abundant north of the Gilt Edge mineralized area, west of Lost Gulch and east of Two Bit Gulch. Particularly large plugs are located on Dome Mountain and in the NE 1/4 of section 31.

Trachyte porphyry generally is unaltered and unmineralized and forms prominent massive to blocky outcrops. Tracing these outcrops, one can clearly show that this rock is present as dikes and plugs intruding either Cambrian Deadwood formation or hornblende trachyte porphyry sills.

A conspicuous feature of trachyte porphyry is large tabular K feldspar phenocrysts, commonly one to three centimeters long. These are set in a granular matrix of hornblende and feldspar. I have trouble using the name "trachyte porphyry" for this rock. In most outcrops the name "hornblende syenite porphyry" is more appropriate owing to granular phaneritic nature of the groundmass. The term "trachyte porphyry" is retained to conform with my understanding of terms used at the mine.

Trachyte porphyry (hornblende syenite porphyry) dikes and plugs generally are unaltered and unmineralized. Outcrops of this rock do show some alteration near the head of Ruby Gulch where they lie within the halo of alteration associated with the Gilt Edge mineralization. This alteration is shown by bleaching with clay carbonate alteration of groundmass.

Mukherjee (1968) maps describe this rock as hornblende monzonite porphyry and recognizes the complex geometry of intrusive relations.

Hornblende Dacite Porphyry/Trachyte Porphyry/Latite Porphyry. Here we encounter problems in rock terminology owing to the altered and mineralized nature of this rock type in the area of exposure. Trachyte porphyry, a mine term, is the principal host rock for disseminated gold mineralization in the mine area. Here this igneous rock unit intrudes in laccolith-like fashion along the Precambrian-Cambrian boundary and is intruded by plugs of quartz trachyte porphyry. West of Two Bit Gulch hornblende dacite porphyry forms a laccolith-like intrusion and sills.

This rock type rarely is unaltered. It consists of hornblende, plagioclase and K feldspar phenocrysts in fine granular to aphanitic matrix. Small quartz phenocrysts are sparsely present. Generally disseminated sulfides are present in vugs and clots in the groundmass. Hornblende dacite porphyry west of Two Bit Gulch contains vugs and cavities containing sulfides, mainly pyrite with minor chalcopyrite. The sulfides appear to have an orthomagmatic origin.

A dike of altered and mineralized intrusive rock extending from the Hoodoo area east-southeastward to Bear Butte Creek was originally mapped as "quartz trachyte porphyry" in the Fall of 1987. Further mapping in 1988 indicates this dike-like body probably is continuous with an part of the intrusive mass mapped as trachyte porphyry in the mine area. It is not the same as the quartz trachyte porphyry of the Rattlesnake or Anchor Hill porphyries.

This rock was mapped and described as "latite porphyry" by Mukherjee (1968). Unfortunately, he does not differentiate it from the intrusive porphyries with the large prominent quartz phenocrysts - an important distinction.

Widespread alteration in this rock in the Spruch Gulch-Two Bit Gulch area and east of Hoodoo is best described as pervasive propylitic alteration. Hornblende has been altered to chlorite or sericite. Feldspars are replaced by albite with sericite and carbonate. Usually K feldspar is unaltered. The groundmass is bleached and contains sericite, clay and carbonate. Pyrite and chalcopyrite or their weathered equivalents are present in vugs and mirolitic cavities.

This rock is very strongly altered in the Gilt Edge ore zone where it consists of clay sericite, alunite and limonites.

In summary, the essential features of this rock type are that is is a quartz-bearing porphyritic rock of quartz latite to dacite composition, it is dike-like or laccolithic in its intrusive form, it carries disseminated sulfides and hydrothermal alteration of varying degrees of intensity that appears orthomagmatic in origin. It is intruded by pipes or plugs of quartz-eye quartz trachyte porphyry, and most important, it is closely associated with gold mineralization (either vein, contact replacement or disseminated).

Quartz Trachyte Porphyry/Quartz-eye Rhyolite Porphyry. This rock occurs as relatively small stocks and plugs in the Gilt Edge mine area and near the Mary mine and about 2000 feet north of the Monarch mine in the SW 1/4 of section 36. The stocks commonly intrude quartz latite or dacite laccoliths, Precambrian schists, Cambrian Deadwood or Tertiary hornblende trachyte porphyry. Mineralized hydrothermal breccias commonly occur along the margins of the plugs and the porphyry itself generally has a protoclastic - almost tuffaceous texture. Commonly quartz trachyte porphyry is pale gray or pale cream, leucocratic with prominent K feldspar and quartz phenocrysts. The quartz phenocrysts are relatively large bipyramidal skeletal quartz "eyes". Although these porphyries are found close to ore, they do not serve as hosts for extensive disseminated gold mineralization. This rock type comprises the Rattlesnake, Dakota Maid and Anchor Hill stocks.

Emplacement of these quartz trachyte porphyry plugs probably was accompanied by a dramatic and explosive expulsion of magmatic volatile fluids but most hydrothermal mineralization ended up in the contact zones around the plugs.

Rhyolite Felsite. This unit is exposed on ridges and walls adjacent to Butcher Gulch and Ruby Gulch, mainly in the NW 1/4 of section 4. It largely is a fine-grained massive aphyric pale buff to cream-colored porcellaneous felsite. It has abundant fractures and weathers to blocky fragments with weak limonite coatings. Faintly developed banding owing to slightly differing grain size probably reflects flow banding. Felsite rests upon Precambrian schists and mineralized Deadwood quartzite. A monitor drill hole located in the NE 1/4, NW 1/4 section 5, passes thru felsite and ended in altered quartzite of the Deadwood formation. This suggests felsite was emplaced on an erosion surface developed across Precambrian and Deadwood formation. We mapped apparent intrusions of hornblende trachyte porphyry into felsite which, if true, would indicate felsite is the earliest igneous rock in the Tertiary sequence. No significant mineralization is found in the felsite. Mukherjee (1968) mapped this unit as rhyolite. He interpreted the northeast trending outcrops of rhyolite near the center of section 4 as dikes of rhyolite intrusive into hornblende trachyte sills. The relationships are ambiguous and could go either way. I think we have to entertain the possibility that rhyolite may be the youngest igneous rock in the igneous sequence and may be post-mineral.

I interpret the felsite as a rhyolitic lava flow or flow-dome complex, probably emplaced as a glassy flow and later devitrified to felsite. Intense fracturing in the unit partly reflects a reaction to volume change accompanying devitrification.

Structural Features

Igneous rocks and mineralization in the area are emplaced into a generally flat-lying or gently-dipping section of Paleozoic sedimentary rocks lying unconformably upon highly deformed Precambrian metamorphic rocks. The general regional dip of the superjacent sediments is gently north and reflects the northerly regional dip off the Black Hills uplift. Local changes in direction and amount of dip reflect doming away from centers of intrusive activity.

One important result of our mapping was definition of faults and structure trends that guided emplacement of dikes and plugs. Definition and careful mapping of specific hornblende trachyte sills allows us to define displacements across the faults.

Principal fault direction in the northwest part of map area is north-south and is reflected by faults along Two Bit Gulch.

This trend changes direction to southeast towards the south and east. South-southeast fault trends are evident at the Mary mine, Monarch mine and Golden Crest mine. These southeast trends extend into the Gilt Edge mine area.

A prominent northeast structure trend is evident between the Gilt Edge mine and Lost Gulch. The Rattlesnake shear zone in the mine area follows this trend. North of the mine area, dikes of trachyte porphyry and hornblende syenite porphyry follow this trend. The northwest margin of the rhyolite felsite body also follow this northeast trend.

Another significant structural trend that passes thru Gilt Edge is a west-northwest trend followed by dikes and faults. This trend evidently follows foliation in the underlying Precambrian schists.

In summary, structure in the Gilt Edge mine area seems to be dominated by steep fractures and faults with three prominent directions: west-northwest, northwest and northeast. These directions, where followed by faults, show offsets in the hornblende trachyte porphyry sills. Some intrusive bodies follow or intrude along these directions. Very likely much of the development and displacement on these structures occurred during evolution of the Gilt Edge igneous complex. In other words, they are of Laramide age.

Mineralization Features

Gold mineralization in the Gilt Edge area is closely associated with development and evolution of the Gilt Edge igneous complex. Host rock types and structure serve to localize ore grade mineralization and these ore controls are summarized below. In a general sense, the mineralized system may be classed as disseminated gold mineralization associated with an alkalic hypabyssal igneous rock complex. Mineralization shows features of the both mesothermal and epithermal ore forming environment. Mineralized breccia pipes, orthomagmatic disseminations of sulfide minerals in igneous rocks and replacement mineralization in calcareous sedimentary units near hypabyssal intrusions are features characteristic of a mesothermal environment. Gold-bearing chalcedonic veins, siliceous jasperoid alteration, hydrothermal breccia bodies and close association of mercury and arsenic with strong gold values are typical of the epithermal environment. My feeling is the gold mineralization is best classed as high level orthomagmatic mesothermal mineralization transitional to epithermal.

Ore Controls. Some of the geologic features tht control the distribution, geometry, and size of the ore grade gold mineralization are reviewed and discussed below.

1. A principal control for disseminated gold mineralization at Gilt Edge is the brecciated wall rocks at the margins of the quartz trachyte porphyry plugs and stocks. These hydrothermal breccia bodies seem to have been a zone where hydrothermal boiling was focused. Mineralization is localized in the breccia bodies and in adjacent fractured wall rocks.
2. The igneous rock unit variously mapped as trachyte porphyry (McLeod), latite porphyry (Mukherjee) or dacite porphyry (Nielsen), is a preferred host for disseminated sulfide mineralization. These hypabyssal plutons appear to be laccolithic in intrusive geometry and appear to contain orthomagmatic sulfides and pervasive alteration. An intrusion of this rock type is an important ore host in the Gilt Edge mine area.
3. The basal quartzite member of the Cambrian Deadwood formation appears to be a favorable host for tabular stratabound disseminated and veinlet gold mineralization, especially near high angle structures. I speculate that permeable nature of the unit and presence of hematite matrix creates a situation within the rock unit in which oxidized formation waters in equilibrium with hematite matrix react with reduced hydrothermal ore fluids. The reaction destabilizes the gold-bisulfide complex and precipitates gold.
4. Dolomitic or calcareous sedimentary units within the Cambrian Deadwood formation are favorable hosts for contact replacement sulfide-rich tactites and massive sulfide replacement deposits, mainly along igneous contacts or adjacent to hydrothermal fissures.
5. Steep north-northeast and northwest fractures and faults serve to channel hydrothermal fluids and access favorable stratigraphic units and in this manner control the location of replacement mineralization and fissure or vein mineralization. Thin fractures or faults are the principal ore controls at Golden Crest and Monarch mines and other mines away from the Gilt Edge center.

Features unfavorable for localizing disseminated gold mineralization include Precambrian host rocks. A little fissure or vein mineralization is present in Precambrian schists, but pervasive mineralization is rare. Shale units within the Deadwood formation are poor hosts for mineralization, possibly owing to their relatively impermeable nature. Hornblende trachyte porphyry sills are another poor host for mineralization. A small volume of disseminated mineralization may lie within this rock type close into the center of the Gilt Edge mineralized system but they are relatively poor hosts for major bulk tonnage ore.

Alteration Features

Gold mineralization at Gilt Edge is associated with abundant amounts of pyrite and relatively sparse amounts of secondary silica. Consequently, alteration associated with ore is characterized by strong pyritization and the strong hypogene acid-leaching associated with strong pyrite mineralization.

We attempt to distinguish two degrees of alteration in our field mapping. An area of strong alteration is closely associated with the gold ore zone at Gilt Edge and shown by a yellow outline on our 200 scale map. Within this area the igneous rocks are strongly bleached and replaced by clay, sericite and alunite. Deadwood quartzite and carbonates are strongly mineralized with pyrite; siltstones are rich in pyrite and are bleached and replaced by clay and sericite. Precambrian schists are altered to a mixture of quartz, sericite, pyrite and clay. Jarosite is a common limonite in the weathering zone owing to high pyrite content.

This very strong alteration also is found along structures, accompanied by anomalous gold values, throughout the map area.

A relatively weak pervasive alteration is classed as propylitic in the field and shown by a pale green color on our maps. Igneous rocks may be either bleached to a pale buff color (in weathered zone) or may acquire a greenish color when unweathered. Hornblende is altered to chlorite, plagioclase is replaced by a mixture of carbonate, clay and albite; charbonate is present in the groundmass. In some areas pyrite is weakly disseminated through the rock and along fractures.

Quartzite and sandstone of the Deadwood formation in this propylitic zone may be bleached and usually contain a little pyrite. Calcareous or dolomitic siltstones usually are converted to a mixture of carbonate, actinolite, diopside, silica and a little pyrite (Deadwood hornfels). Carbonate units may be recrystallized. Gold values may be present in detectable amounts in altered Deadwood sediments in this zone.

Weathered rocks of the propylitic alteration zone may show bleaching and contain a capping of geothitic limonites.

Some of this relatively weak alteration may be deuteric in its origin rather than related to the center of gold mineralization.

POTENTIAL ORE TARGETS

Anchor Hill

The Anchor Hill stock consists of quartz "eye" trachyte porphyry and intrudes hornblende trachyte porphyry sills at the present erosion surface. Wall rocks at the southeast margin are not well exposed but float and soil composition suggest that hornblende trachyte porphyry around the southeast margin has very strong argillic alteration. If true, this suggests the underlying Cambrian Deadwood should be strongly altered and mineralized. The south and east margins of the Anchor Hill stock is the place to drill to encounter mineralized Deadwood.

Golden Crest Mine

This old mine lies in the SW 1/4 of section 6 and is developed on a northwest structure with workings present for an inferred strike distance of about 1500 feet. Old records indicate mine development is located only southeast of the old main shaft. Distribution of old workings suggest that ore is localized in sediments of the Cambrian Deadwood formation. Old records suggest ore lies along the structure and is vein-like with widths up to 14 feet, and give an estimated reserve of 375,000 tons of ore at \$8.00 or 0.4 opt gold (at \$20.00 per oz. Au). Making some assumptions the data suggest this so-called ore body may be a near-vertical tabular body 1500 feet along strike, 14 feet wide and 200 feet vertical distance in the Cambrian Deadwood formation. We find no tailings at the millsite so very likely little or no ore was processed at the site but some may have been shipped directly to toll mills in Deadwood. Our sampling and mapping along the structure indicates that ore grade mineralization is narrow and lies in Deadwood hornfels confined to the narrow structure. I don't see any significant potential for significant tonnage of near surface ore. This mine area could possibly contain +100,000 ounces of recoverable gold in a setting amenable to underground mining. Perhaps at some future date several drill holes to test for ore grade mineralization will be justified.

Monarch Mine

This old mine lies in the NW 1/4 of section 1. It operated intermittently from 1902 to 1936 and produced 7940 tons of direct shipping ore with an average grade of 0.54 opt gold. The mine is developed by several shafts and adits and several thousand feet of underground workings. Limited geologic information suggests that ore grade mineralization is present in patches within dolomite of the lower part of the middle member of the Cambrian Deadwood formation; mineralization lies adjacent to steep north to northwest faults.

An evaluation done in 1984 by Apex Minerals, Inc. included an underground sampling program. Results of this underground work suggests an inplace measured reserve of about 440 tons at a grade of about 0.3 opt gold. Additional small tonnages of probable inplace reserves are estimated. Average thickness of overburden is estimated at 100 feet. Average thickness of ore is 3 feet. Thus, strip ratio of waste to ore is about 30 to 1. Possibility of developing significant tonnages of minable ore is very remote.

Homestake took a look at the possibility of shipping surface waste dumps to Lead. Apex Minerals, Inc. estimates that waste dumps contain 5300 tons at 0.165 opt Au but Homestake took no action on mining. These dumps possibly may constitute a small reserve of material for processing thru the future sulfide plant at Gilt Edge.

Mary Mine Area

The Mary mine is located near the center of section 1. A mill was constructed and now lies in ruins. A few short adits were dug into a few mineralized structures. I can find no evidence that any significant ore was developed or shipped. A little replacement mineralization is present in dolomitic siltstone of the Deadwood formation adjacent to steep north-trending fractures. Our mapping suggests that mineralization at the Mary mine is limited to small pods and zones along structure without any substantial tonnage potential.

Two Bit-Spruce Gulch Area

The area between Spruce Gulch and Two Bit Gulch, namely the west 1/2 of section 36 and north 1/2 of section 6, is underlain by a geologic setting similar to that of the Gilt Edge mine area. A laccolithic intrusion of dacite porphyry has intruded the Cambrian Deadwood formation. Small plugs of quartz-eye trachyte porphyry intrude the dacite and Cambrian Deadwood formation. Our sampling in this area shows that gold mineralization is present along structures and as disseminations and replacement mineralization in quartzite and carbonate units respectively. The north part of this area has been explored with drill holes by Utah International in an effort to find minable replacement mineralization in the Cambrian units. Limited mineralization at the Monarch and Mary mines apparently is related to this center of mineralization.

This Two Bit-Spruce Gulch area has limited outcrop exposure. A soil geochemical survey with analyses for gold and arsenic may be a possible technique to search for and evaluate possible ore target. Homestake's interest in this area undoubtedly is for potential mineralization associated with the Tertiary intrusions. Land acquisition activities in this area should continue.

El Refugio Mine Area

As a result of our regional mapping, an area of limestone replacement mineralization was encountered and mapped south of the Refugio mine in the NE 1/4 of section 4. Dolomitic siltstone of the Cambrian Deadwood formation is injected by a hornblende trachyte sill. Jaspery silicification with pods and blebs of goossanous limonites has extensively replaced carbonate units of the Deadwood. Many pits and trenches have been dug in this area to explore this mineralization.

We collected a few rock chip samples from surface pits and trenches. Gold values up to 0.19 opt were obtained. Assuming a strike length of 2000 feet, a width of 400 feet and a thickness of 20 feet, this area can contain 1.5 million tons of mineralized rock at grass roots.

This area should be mapped and sampled in considerable detail in an effort to define a drill target.

Anchor Hill West

This potential ore target area has poorly defined limits or boundaries but is considered to be several thousand feet across and centered near the center of section 6 about 2000 feet west of Anchor Hill.

This area is underlain by thick hornblende trachyte porphyry sill. Several small plugs of hornblende syenodiorite in this area are probably feeders for the thick sills. We mapped a significant area of propylitic alteration and disseminated pyrite in the sill. This zone of weak alteration and mineralization appears to be 1000 to 2000 feet across. Prospects dug into faults and fractures in this area explore altered and mineralized rock which give anomalous gold values.

Cambrian Deadwood carbonates concealed by the hornblende trachyte porphyry sill should be tested for disseminated replacement mineralization. Condemnation drilling for the sulfide plant site in this area should be designed with holes that penetrate to sufficient depth to test the Cambrian formations.

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GEOCHEMICAL SAMPLE DATA SHEET

PROJECT: GILT EDGE AREA, MAPPING AND RECON., LAWRENCE COUNTY, SOUTH DAKOTA

Rock Chip Samples collected by T.C. Patton, November - December 1987

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb	Ag ppm
2639 (11/21/87 TCP	SW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 746,030 N 1,123,620 E	Rock chip sample from mine dump. Argillically altered Thtp? with jarosite, goethite; some thick gossan after sulfides.	20	0.9
2640 (11/21/87) TCP	NE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 6 T4N, R4E 746,610 N 1,122,130 E	Rock chip sample from prospect dump. Argillically altered Thtp. with strong jarosite, goethite and limonite after pyrite.	< 5	1.5
2641 (11/21/87) TCP	SW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 745,940 N 1,123,900 E	Rock chip sample from prospect dump. Argillically altered Thtp with strong limonite.	15	1.4
2642 (11/21/87) TCP	SW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 745,340 N 1,124,450 E	Rock chip sample from prospect dump. Deadwood hornfels, Mn stain, FeOx.	45	3.2
2643 (11/22/87 TCP	Mary Mine SW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 748,210 N 1,119,180 E	Rock chip sample from outcrop of bleached argillized porphyry dike on contact in Cambrian Deadwood sandstone, hematite, goethite jarosite on fract.	130	0.7
2644 (11/23/87) TCP	SW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 36 T5N, R3E 751,060 N 1,118,390 E	Rock chip sample from prospect dump. Argillized Thtp with strong jarosite, goethite.	75	0.6

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PROJECT: GILT EDGE AREA, MAPPING AND RECON., LAWRENCE COUNTY, SOUTH DAKOTA
 Rock Chip Samples collected by T.C. Patton, November - December 1987

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb	Ag ppm
2645 (11/23/87) TCP	NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 2 T4N, R3E 750,430 N 1,115,610 E	Rock chip sample. Thtp with fine diss. pyrite, 10% sulfides.	20	0.8
2646 11/23/87) TCP	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 1 T4N, R3E 749,900 N 1,116,900 E	Rock chip sample from prospect dump. Thtp with pyrite? on fracture, strong goethite and jarosite.	25	0.8
2647 (11/23/87) TCP	SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 746,130 N 1,120,750 E	Rock chip samples from outcrops along power line cut; Thtp, heavily iron-stained, some open fracture.	5	0.8
2648 (11/23/87) TCP	NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 746,760 N 1,120,250 E	Rock chip sample from prospect dump; porphyry with dark phenocrysts etc., disseminated pyrite, argillized, felsic, etc.	5	1.2
2649 (11/23/87) TCP	NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 747,750 N 1,119,860 E	Rock chip sample from prospect dump. Deadwood quartzite and Thtp, heavy FeOx, disseminated on fracture	50	1.1
2650 (11/23/87) TCP	NE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 7 T4N, R4E 744,100 N 1,122,790 E	Rock chip sample from face of 300' adit; Deadwood hornfels.	160	>50

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PROJECT: GILT EDGE AREA, MAPPING AND RECON., LAWRENCE COUNTY, SOUTH DAKOTA

Rock Chip Samples collected by T.C. Patton, November - December 1987

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
A (11/87) TCP	NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 12 T4N, R3E 745,090 N 1,120,410 E	Rock chip sample Thtp, FeOx, sampled from N50E structure.	520	> 50
B (11/87) TCP	SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 746,590 N 1,119,250 E	Rock chips, rhyolite intrusion breccia with strong limonite.	80	3.5
C (11/87) TCP	NW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 747,960 N 1,119,200 E	Rock chips, diorite with disseminated pyrite.	50	1.1
D (11/87) TCP	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 T4N, R3E 749,210 N 1,119,230 E	Rock chip sample, Cambrian Deadwood quartzite, silicified, pyritized - from Two Bit Dump.	15	0.6
E (11/87) TCP	NW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 747,560 N 1,124,170 E	Rock chips, diorite with disseminated and fracture controlled pyrite.	1100 (.032)	1.5
F (11/87) TCP	NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 747,960 N 1,125,126 E	Rock chips of Thtp - subcrop, goethite - jarosite, minor MnO ₂ .	40	0.9
G (11/87)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 6 T4N, R4E 748 130 N	Rock chips, Cambrian Deadwood quartzite, weak limonite.	70	< 0.5

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PROJECT: GILT EDGE AREA, MAPPING AND RECON., LAWRENCE COUNTY, SOUTH DAKOTA
 Rock Chip Samples collected by T.C. Patton, November - December 1987

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
H (11/87) TCP	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 6 T4N, R4E 748,230 N 1,124,770 E	Rock chips of Thtp, bleached and argillically altered.	50	0.7
I (11/87) TCP	SW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 6 T4N, R4E 748,190 N 1,124,380 E	Rock chips of Thtp, argillized, bleached, minor FeOx	40	1.3
J (11/87) TCP	SW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 1 T4N, R3E 746,820 N 1,115,510 E	Rock chips of Precambrian phyllite, Cambrian Deadwood quartzite from prospect dump, locally intense limonite.	< 5	0.5
K (11/87) TCP	NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 T4N, R3E 750,330 N 1,120,050 E	Rock chips from Cambrian Deadwood hornfels with minor limonites.	5	0.5
L	SW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 6 T4N, R4E 748,320 N 1,121,170 E	Rock chips from diorite with 5-10% disseminated and fracture-controlled pyrite.	< 5	1.5
M	NW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 8 T4N, R4E 742,060 N 1,127,570 E	Rock chip of Precambrian chert with limonites	< 5	1.2

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2651 (11/22/87)	NW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 5 T4N, R4E Upper Ruby Gulch 746,900 N 1,130,010 E	Rock chip sample, natural outcrop; Trachyte porphyry with large blocky K-feldspar in granular matrix; strong propylitic, clay-sericite alteration with goethite and jarosite after sulfides.	5	0.9
2652 (11/22/87)	NW $\frac{1}{4}$, WE $\frac{1}{4}$, Sec. 5 Upper Ruby Gulch 746,920 N 1,129,770 E	Same as above. Former sulfides about 3%.	5	1.1
2653 (11/22/87)	NW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 5 T4N, R4E Upper Ruby Gulch 746,580 N 1,129,920 E	Rock chip sample, select high grade from dump of old mine; brecciated and mineralized Deadwood quartzite near contact with Trachyte porphyry, pyrite Ca 5%, partly oxidized.	110 (.003)	1.9
2654 (11/22/87)	Center Sec. 5 Upper Ruby Gulch 747,860 N 1,128,590 E	Rock chip sample from dump of prospect, representative, oxidized sulfide mineralization on fractures in hornblende trachyte and Deadwood hornfels.	240 (.007)	< 0.5
2655 (11/24/87)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 4 T4N, R4E ca. 1000 S of E 1 Refugio mine 747,840 N 1,135,840 E	Rock chip sample from road cut; mineralized Deadwood hornfels, gossanous limonites and jaspery silica replacements of calcareous siltite; representative.	5	< 0.5

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2656 (11/24/87)	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 4 T4N, R4E 748,060 N 1,135,430 E	Rock chip sample from road cut; mineralized Deadwood hornfels, calcareous siltstone with heavy limonites, Mn oxides, some gossan layers, representative sample.	< 5	< 0.5
2657 (11/24/87)	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 4 T4N, R4E 747,790 N 1,135,280 E	Rock chip sample from road cut in mineralized Deadwood hornfels; calcareous siltstone with heavy limonites, Mn oxides and gossanous layers, representative.	10	< 0.5
2658 (11/24/87)	SW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 5 T4N, R4E 745,330 N 1,128,930 E	High grade rock chip sample, dump of adit; oxidized gossanous quartz trachyte porphyry, sheared; moderate to strong bleaching; high sulfides.	190 (.006)	2.3
2659 (11/24/87)	NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 8 T4N, R4E Ridge N of Straw- berry Creek 744,530 N 1,129,540 E	Rock chip sample of float near outcrop; oxidized, fractured and mineralized ferruginous Deadwood siltstone; abundant limonites and jasper streaks along beds and in fractures.	< 5	1.2
2660 (11/25/87)	NE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 5 T4N, R4E Head of Butcher Gulch 750,010 N 1,128,220 E	Rock chip sample, dump of prospect; oxidized, limonite-stained mineralized Deadwood hornfels near trachyte porphyry contact; gossanous streaks and blebs; representative sample.	130 (.004)	0.8
2661 (11/25/87)	Near center of NE $\frac{1}{4}$, Sec. 5 Upper Butcher Gulch 749,050 N 1,129,830 E	Rock chip sample, dump of prospect adit, high grade sample mineralized Deadwood hornfels along contact with trachyte porphyry; abundant goethite.	1100 (.032)	1.8

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2662 (11/25/87)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 5 Head of Butcher Gulch 749,540 N 1,129,370 E	Rock chip sample, dump of prospect, oxidized gossanous mineralization in Deadwood hornfels, streaks of gossan in calc-silicate hornfels, fractured and brecciated near contact with trachyte porphyry.	10	7.5
2663 (11/25/87)	Near center NW $\frac{1}{4}$, Sec. 5 Head of Butcher Gulch 749,470 N 1,127,780 E	Representative rock chip sample, dump of old abandoned mine shaft; partly oxidized mineralized Deadwood hornfels, \pm 5% pyrite, partly oxidized.	2100 (.061)	35
2664 (11/25/87)	SW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 5 Head of Butcher Gulch 748,230 N 1,127,820 E	Representative rock chip sample from prospect dump; oxidized, silicified, altered Deadwood hornfels, abundant oxidized pyrite, near contact with trachyte porphyry.	1150 (.033)	2.3
2665 (12/1/87)	NE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 5 Head of Ruby Gulch 747,500 N 1,128,330 E	Rock chip sample, dump of prospect trench, oxidized, mineralized trachyte porphyry, clots of limonites after mafics.	1100 (.032)	3.3
2666 (12/1/87)	NW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 5 Head of Ruby Gulch 747,010 N 1,129,230 E	Rock chip sample of float, near outcrop, mineralized trachyte porphyry, strong alteration with disseminated limonite after pyrite 2-5%.	15	1.1
2667 (12/1/87)	Near SE Corner, SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 5 500' E. of Hoodoo Shaft 745,030 N 1,128,510 E	Rock chip sample wall, of prospect cut; mineralized breccia on contact of quartz trachyte porphyry; angular fragments of trachyte porphyry and Precambrian schist in a quartz trachyte porphyry matrix; very high sulfides with jarositic limonites, representative.	80 (.002)	1.1

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2668 (12/5/87)	1/2 mi. SW of Dome Mt. NW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 32 T5N, R4E	Representative rock chip sample down wall of prospect pit, 6' chip sample across mineralized beds of Deadwood quartzite; heavy sulfide mineralization (5%) oxidized to jarosite and goethite.	760 (.022)	1.5
2669 (4/28/88)	Near NE corner, SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 35 T5N, R3E Head of Spruce Gulch 752,340 N 1,116,920 E	Select rock chip sample of mineralized Deadwood hornfels from dump of old prospect; pods of gossan, limonites and partly oxidized pyrite in a siliceous matrix replacing limey siltstone.	2260 (.066)	11
2670 (4/28/88)	SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 35 T5N, R3E Head of Spruce Gulch 752,180 N 1,116,600 E	Representative rock chip sample, natural outcrop and float; limonite-stained Deadwood quartzite with some calcareous siltstone, silicified and replaced by gossanous limonites.	15	0.7
2671 (4/28/88)	SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 35 Head of Spruce Gulch 751,370 N 1,117,020 E	Representative rock chip sample of outcrop or float near outcrop; mineralized trachyte porphyry and hornblende dacite, the latter is vuggy with 1% disseminated pyrite and strong propylitic to clay-sericite alteration.	233 (.007)	< 0.1
2672 (2/28/88)	SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 35 Head of Spruce Gulch 752,320 N 1,116,920 E	Representative rock chip sample from dump of small prospect pit; oxidized medium-grained vuggy hornblende dacite; +2% disseminated pyrite (oxidized), sheared with silicification.	13	0.2

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2673 (4/28/88)	Near SE Corner, NW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 35 T5N, R3E 752,620 N 1,116,600 E	Representative rock chip sample, dump of small prospect pit; ferruginous quartzite and calcareous siltstone of the Deadwood formation; limonites and gossanous replacements of sulfides.	< 5	0.4
2674 (4/28/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 35 Upper Spruce Gulch 754,370 N 1,116,600 E	Representative rock chip sample, dump of prospect; Hornblende dacite porphyry sill, weak bleaching, propylitic alteration with ca. 1% disseminated pyrite (oxidized).	750 (.021)	0.8
2675 (4/28/88)	Near SE corner, NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 35 T5N, R3E 752,480 N 1,117,120 E	Representative rock chip sample, dump of small prospect; mineralized Deadwood quartzite with abundant gossanous limonite.	218 (.007)	0.7
2676 (4/28/88)	Near SW Corner, NW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 36 T5N, R3E 752,700 N 1,117,200 E	Representative rock chip sample, dump of prospect pit in mineralized Deadwood quartzite; abundant limonites after sulfides.	6	0.6
2677 (4/28/88)	Near SW Corner, SW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 753,670 N 1,117,225 E	Rock chip sample, dump of prospect pit; slightly high graded with selected gossanous material, mineralized Deadwood hornfels; gossanous limonite after massive pyrite replacing limey beds.	1693 (.049)	0.8

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2678 (4/28/88)	Near NW Corner, SW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 754,750 N 1,117,360 E	Representative rock chip sample from dump of prospect pit; altered and mineralized hornblende dacite porphyry; propylitic alteration; ca 1% disseminated and fracture-controlled pyrite (oxidized).	213 (.006)	0.5
2679 (4/28/88)	NW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 36 752,700 N 1,117,520 E	Representative rock chip sample, dump of small prospect pit; reddish-purple mineralized Deadwood quartzite and hornfels, strong limonite after sulfides and chalcedonic silica.	35 (.0011)	0.1
2680 (2/29/88)	NW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 36 755,730 N 1,117,870 E	Selected high grade rock chip sample, dump of prospect pit; bleached mineralized hornblende dacite porphyry; slightly vuggy with propylitic alteration; strong oxidized sulfides along structure, sample of mineralized breccia.	4500 (.131)	0.2
2681 (4/29/88)	NW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 35 T5N, R3E 753,130 N 1,118,270 E	Representative rock chip sample of mineralized breccia from dump of prospect trench; greenish gray brecciated Deadwood hornfels, silicified fragments in a limonite matrix after sulfides.	35	0.1
2682 (4/29/88)	Near SW Corner, NE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 754,975 N 1,118,725 E	Slightly high graded rock chip sample, dump of prospect pit, weakly mineralized Deadwood hornfels, nodules of carbonate replaced by limonites after sulfides.	25	0.1
2683 (4/29/88)	SE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 754,250 N 1,118,720 E	Representative rock chip sample, dump of prospect pit; medium grained vuggy hornblende dacite porphyry, weak propylitic alteration with 1% disseminated py.	68	0.6

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2684 (4/29/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 754,860 N 1,118,150 E	Rock chip sample, dump of old prospect adit; Deadwood quartzite in contact with hornblende dacite porphyry. Sample of mineralized quartzite, silicified, jaspery alteration with abundant limonite after pyrite.	4340 (.126)	2.6
2685 (4/29/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 755,410 N 1,118,000 E	Select rock chip sample, dump of prospect pit; mineralized Deadwood quartzite, ferruginous matrix, nodules of gossanous limonites; quartzite cut by limonite-lined fractures.	2800 (.081)	1.0
2686 (4/29/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 755,690 N 1,117,870 E	Select, slightly high grade rock chip sample from dump and walls of prospect pit; medium-grained vuggy hornblende dacite porphyry cut by steep limonite-coated fractures (N20°E).	6600 (.191)	1.6
2687 (4/29/87)	SW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 25 T5N, R3E 756,470 N 1,117,990 E	Slightly high grade rock chip sample, dump of prospect pit, hornblende dacite altered to aplitic rock; about 2% disseminated pyrite oxidized to limonite.	108 (.003)	0.1
2688 (4/29/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 755,720 N 1,118,150 E	Select rock chip sample, dump of prospect adit; mineralized Deadwood hornfels, silicified with gossanous blebs of oxidized sulfides.	>10,000 (>.292)	6.2
2689 (4/30/88)	NE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 755,450 N 1,119,370 E	Select rock chip sample, dump of small prospect pit; medium-grained hornblende dacite porphyry with vuggy cavities containing clots of limonite; limonites on fractures and in narrow breccia zones.	78	0.1

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2690 (2/30/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 36 T5N, R3E 755,360 N 1,120,010 E	Select rock chip sample, dump of prospect pit, medium-grained hornblende dacite porphyry; vuggy with clots of limonite in vugs and limonite on fractures.	> 10,000 (> .292)	1.0
2691 (4/30/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 36 755,830 N 1,120,460 E	Select rock chip sample, dump of prospect pit; medium-grained hornblende dacite porphyry, propylitic alteration; blocky fractures with limonite after sulfides on fractures.	81	0.1
2692 (4/30/88)	NE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 755,840 N 1,118,940 E	Rock chip sample dump of prospect pit, medium-grained hornblende dacite porphyry sill, slightly vuggy Mn oxide and limonites on fractures.	69	0.1
2693 (2/30/88)	SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 25 T5N, R3E 756,230 N 1,118,890 E	Select rock chip sample, dump of small prospect; ocherous brown ferruginous Deadwood hornfels, some limonite may be after sulfide but much appears matrix to sandstone.	117 (.003)	0.1
2694 (4/30/88)	SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 25 T5N, R3E 758,100 N 1,119,385 E	Representative rock chip sample, dump of shaft, soft, clayey ocherous gossan, possible oxidized massive sulfide replacement of Deadwood hornfels.	1226 (.036)	0.9
2695 (4/30/88)	NE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 25 758,260 N 1,119,105 E	Representative rock chip sample, dump of prospect. Ordovician quartzite and shale; heavily impregnated by sulfide now oxidized to limonites.	796 (.023)	1.0
2696 (4/30/88)	SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 25 757,410 N 1,119,230 E	Representative rock chip sample, dump of shaft, mineralized Deadwood hornfels, ferruginous sandstone and calcareous siltstone heavily replaced by sulfides now oxidized to limonites.	1598 (.046)	0.2

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Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2697 (5/5/88)	NE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 754,930 N 1,119,420 E	Representative rock chip sample, walls and dump of small prospect; medium-grained gray hornblende dacite. Vuggy with 1% oxidized pyrite disseminated in vugs, propylitic alteration.	8	0.1
2698 (5/5/88)	Near NE Corner, NW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 36 T5N, R3E 753,260 N 1,118,550 E	Representative rock chip sample, dump of prospect pit medium-grained, gray hornblende dacite porphyry, propylitic alteration and 1% disseminated oxidized pyrite in vugs.	119	0.6
2699 (5/5/88)	Near NE Corner, NE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 36 T5N, R3E 753,340 N 1,118,640 E	Representative rock chip sample, dump of prospect pit, mineralized breccia with angular fragments of hornblende dacite, Precambrian schist, Deadwood hornfels in a dark siliceous matrix with abundant clots and veinlets of limonite after sulfides,	538 (.016)	2.4
2700 (5/5/88)	NE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 36 T5N, R3E 753,265 N 1,119,280 E	Select rock chip sample, dump of prospect pit; vuggy, brecciated mineralized Deadwood quartzite, and hornblende dacite porphyry, with clots of limonites after sulfide disseminated through the rock.	< 5	0.2
2951 (5/5/88)	NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 36 T5N, R3E 752,700 N 1,118,900 E	Rock chip sample, natural outcrop of breccia, angular fragments of hornblende dacite porphyry and Deadwood hornfels in a greenish propylitically altered matrix with disseminated limonites after pyrite.	165 (.005)	0.8
2952 (5/6/88)	Near SW Corner NE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 36 752,200 N 1,118,730 E	Rock chip sample, dump of prospect; mineralized breccia with angular fragments of Precambrian schist, mineralized Deadwood hornfels in a white siliceous "tuffaceous" matrix with bi-pyramidal quartz phenocrysts	40	0.2

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Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2953 (5/6/88)	SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 35 752,170 N 1,119,580 E	High grade rock chip sample from dump of prospect pit; Deadwood hornfels, reddish-brown jaspery silicification with gossanous limonites.	2310 (.067)	0.9
2954 (5/6/88)	SW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 36 T5N, R3E 751,880 N 1,119,890 E	Representative rock chip sample, dump of caved adit; white, limonite-stained medium-grained hornblende dacite porphyry, vuggy with 1% disseminated limonite after pyrite.	150	0.2
2955 (5/9/88)	Near NE Corner SW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 31 T5N, R3E 754,460 N 1,123,640 E	Representative rock chip sample, dump of prospect adit; ocherous, rusty ferruginous sandstone of the Deadwood fm, some gossanous layers.	10	0.4
2956 (5/10/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 T4N, R3E 750,700 N 1,118,850 E	Representative rock chip sample, exposure in prospect pit; Deadwood quartzite with limonite matrix and clots of gossanous limonites after sulfides.	51	0.4
2957 (5/10/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 36 T5N, R3E 755,740 N 1,120,990 E	Representative rock chip sample, dump of prospect shaft; hornblende trachyte porphyry with disseminated pyrite on fractures and propylitic alteration; oxidized.	< 5	0.3
2958 (5/10/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 36 T5N, R3E 755,740 N 1,120,990 E	Representative rock chip sample, dump of prospect shaft collared in Qal; sample of Deadwood quartzite and hornfels; weakly mineralized with limonite in matrix and on fractures in ferruginous sandstone.	171	0.4

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Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2959 (5/10/88)	NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 36 T4N, R3E 755,240 N 1,121,540 E	Representative rock chip sample; dump of prospect pit; ferruginous sandstone of Deadwood hornfels; many calcite veinlets; oxidized.	5	0.6
2960 (5/10/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 36 T5N, R3E 754,555 N 1,121,400 E	Rock chip sample, dump of flooded shaft; unoxidized Deadwood quartzite; gray, fractured with about 5% disseminated pyrite and vuggy quartz.	796 (.023)	20.0
2961 (5/12/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 36 T5N, R3E 754,300 N 1,121,650 E	Rock chip sample, dump of prospect pit; representative sample of ocherous limonitic dolomitic sandstone of Deadwood hornfels, oxidized.	29	0.8
2962 (5/12/88)	SW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 36 T5N, R3E 751,070 N 1,120,970 E	Representative rock chip sample from exposure in prospect pit, siliceous siltstone of Deadwood hornfels; fractured and brecciated, cemented by goethite after sulfide; possible fault zone; oxidized.	43	0.6
2963 (5/12/88)	NE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 6 T4N, R4E 749,705 N 1,122,625 E	Representative rock chip sample, dump of prospect; hornblende trachyte porphyry sill, propylitic alteration, weak goethite limonite after sulfides and weak silicification.	< 5	0.3
2964 (5/13/88)	NE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 31 T4N, R4E 753,170 N 1,123,890 E	Rock chip sample, prospect cut, 5 to 10-foot wide chloritized fault breccia between hornblende trachyte porphyry and Deadwood hornfels; weak silicification and minor limonite clots and veinlets.	36	2.0

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Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2965 (6/2/88)	Near SW Corner NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 6 T4N, R4E 749,620 N 1,123,795 E	Representative rock chip sample, dump of prospect shaft; sheared and brecciated Deadwood hornfels with jaspery silica alteration and abundant gossanous limonite after sulfide.	139	1.4
2966 (6/2/88)	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 6 T4N, R4E 748,850 N 1,124,395 E	Representative rock chip sample, dump of prospect pit; hornblende trachyte porphyry, bleached, propylitic alteration faced with limonite veinlets and limonites after disseminated pyrite; oxidized.	21	.2
2967 (6/2/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 6 T4N, R4E 750,115 N 1,124,410 E	Rock chip sample, dump of prospect pit, selected sample of gossanous dolomite of Deadwood hornfels, probably mineralized fault zone.	231	.6
2968 (6/2/88)	Near SW Corner NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 6 749,700 N 1,123,755 E	Representative sample, dump of prospect adit, sample of fractured, brecciated and mineralized dolomitic siltstone of Deadwood hornfels; gossanous blebs in breccia; oxidized.	52	.4
2969 (6/3/88)	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 T4N, R3E 748,860 N 1,119,030 E	Rock chip sample across 6 foot face in prospect cut; fine-grained Deadwood quartzite and hornfels; limonite matrix and on fractures; some after sulfides; oxidized.	211	.1
2970 6/3/88)	Near SW Corner NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 T4N, R3E 749,500 N 1,118,430 E	Representative rock chip sample, natural outcrop; Deadwood dolomite and silty dolomite; very weak limonite mineralization; near contact with quartz trachyte porphyry.	12	< .1

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2971 (6/3/88)	SE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 1 749,430 N 1,117,720 E	Rock chip sample, dump of caved adit; select sample of mineralized hydrothermal breccia, fragments of Deadwood hornfels in limonite matrix.	166	3.1
2972 (6/3/88)	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 T4N, R3E 749,050 N 1,119,190 E	Rock chip sample from "ore" stock pile near 2-Bit adit; mineralized quartzite and hornfels of Deadwood formation; brecciated with quartz veinlets, limonite after sulfides, and specularite.	6200 (.180)	> 50.0
2973 (6/4/88)	NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 T4N, R3E 749,795 N 1,120,320 E	Rock chip sample, float, select sample of altered and mineralized Deadwood quartzite; bleached and laced with limonite veinlets.	24	1.0
2974 (6/4/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 749,530 N 1,120,640 E	Representative rock chip sample, dump of prospect adit driven on low angle contact between hornblende trachyte porphyry and gray Deadwood argillite; select sample of fractured hornfels with limonite.	46	1.5
2975 (6/4/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 748,650 N 1,119,780 E	Representative rock chip sample, 4 feet down exposure and across beds exposed in portal of caved adit; fractured and brecciated gray argillite of Deadwood hornfels, laced with veinlets of calcite, iron carbonate and limonites.	33	.1
2976 (6/5/88)	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 T4N, R3E 748,500 N 1,119,440 E	Rock chip sample, dump of adit at Mary mine; selected to represent mineralized Deadwood quartzite; fractured, laced with coxcomb quartz veinlets, limonite veinlets, with disseminated pyrite, oxidized.	> 10000 (1.022)	> 50.0

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2977 (6/5/88)	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 T4N, R3E 748,410 N 1,119,450 E	Rock chip sample dump of adit at Mary mine; selected to represent mineralized siltstone and dolomitic siltstone of Deadwood hornfels; strongly fractured with abundant limonite after sulfides.	440 (.013)	38.0
2978 (6/5/88)	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 T4N, R3E 748,380 N 1,119,260 E	Representative rock chip sample from wall of prospect pit at Mary mine; strongly fractured and limonite-impregnated argillite and dolomitic siltstone of Deadwood hornfels.	124	1.3
2979 (6/5/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 T4N, R3E 748,315 N 1,119,160 E	Representative rock chip sample wall of prospect pit at Mary mine; strongly fractured and mineralized Deadwood hornfels and quartzite; abundant limonite after pyrite with hydrothermal silica alteration; oxidized.	33	.6
2980 (6/5/88)	NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 747,230 N 1,119,735 E	Rock chip sample, dump of caved adit; selected mineralized material, brown jaspery silica and gossan; probably mineralized fault cut by adit.	735	44.4
2981 (6/5/88)	Near Center SE $\frac{1}{4}$, Sec. 1 746,810 N 1,119,435 E	Rock chip sample, dump of small prospect, selected to represent mineralized Deadwood quartzite, strong limonite after sulfides in breccia matrix; possible mineralized fault.	18	.8
2982 (6/5/88)	SW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 746,815 N 1,119,140 E	Representative rock chip sample, dump of prospect pit; brecciated, silicified and mineralized Deadwood hornfels; bleached with chalcedonic silica and limonites.	80	2.1

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SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2983 (6/5/88)	SW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 746,475 N 1,119,430 E	Representative rock chip sample dump of prospect in mineralized breccia; angular fragments of altered Precambrian schist, Deadwood hornfels, and hornblende trachyte porphyry in a white quartz trachyte matrix with limonite veinlets and disseminations.	9	.5
2984 (6/5/88)	SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 1 746,100 N 1,117,750 E	Representative rock chip sample, exposure in prospect pit; limonite impregnated Deadwood quartzite; ferruginous dolomitic quartzite.	9	.3
2985 (6/6/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 748,400 N 1,119,600 E	Rock chip sample, dump of prospect pit, blocky Deadwood quartzite with disseminated limonites after sulfides in quartzite matrix and on fractures.	54	.5
2986 (6/6/88)	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 1 747,980 N 1,119,540 E	Rock chip sample, 4 feet down exposure in prospect cut; fractured Deadwood quartzite laced with white quartz veinlets and limonite veinlets.	97	.11
2987 (6/6/88)	NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 748,090 N 1,119,850 E	Rock chip sample dump of prospect pit, selected gossan-massive sulfide replacement of mineralized Deadwood dolomitic siltstone; probable mineralized fault zone.	3550 (.103)	2.2
2988 (6/6/88)	NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 747,500 N 1,119,830 E	Rock chip sample, dump of prospect adit, selected gossan fragments; jaspery with quartz veinlets; probably a mineralized fault.	326 (.009)	43.4

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Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
2989 (6/7/88)	NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 747,390 N 1,120,955 E	Rock chip sample, dump of prospect pit along fault; brown jaspery vein silica and jaspery replacement of dolomite of Deadwood hornfels.	145	1.7
2990 (6/7/88)	NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 747,200 N 1,120,950 E	Rock chip sample, dump of prospect pit along fault; mineralized and sheared Deadwood hornfels; select sample of porous vuggy gossan.	6620 (.192)	10.1
2991 (6/7/88)	SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 746,430 N 1,120,600 E	Rock chip sample, dump of prospect pit along fault; select high graded sample of mineralized Deadwood hornfels and hornblende trachyte porphyry; bleached, laced with quartz and limonite veinlets.	408 (.012)	> 50.0
2992 (6/7/88)	SW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 6 T4N, R4E 746,000 N 1,121,150 E	Rock chip sample, dump of prospect pit; selected mineralized samples of Deadwood hornfels and hornblende trachyte porphyry; bleached and laced with limonite veinlets; some gossanous blebs.	50	1.8
2993 (6/7/88)	NW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 6 T4N, R4E 747,870 N 1,121,580 E	Representative rock chip sample from exposure in portal of prospect adit; Deadwood hornfels cut by structure that trends N60°E - 80°S; weak limonites after sulfides; carbonate veins.	633 (.018)	17.5
2994 (6/8/88)	SW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 6 T4N, R4E 745,270 N 1,121,435 E	Rock chip sample, dump of prospect adit; select sample of mineralized Deadwood quartzite; quartz-limonite veins and impregnations; oxidized.	23	1.0

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Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./5on)	Ag ppm
2995 (6/8/88)	SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 6 T4N, R4E 745,090 N 1,122,700 E	Representative rock chip sample down wall of prospect pit; reddish brown mineralized Deadwood hornfels; sheared and impregnated with limonites; fault trends N40°W, 90° dip.	> 10000 (.323)	2.2
2996 (6/8/88)	SW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 6 746,395 N 1,121,670 E	Representative rock chip sample, from prospect pit near Golden Crest vein; crushed and fractured hornblende trachyte porphyry with propylitic alteration and moderate limonites after sulfides.	64	.3
2997 (6/8/88)	NW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 747,740 N 1,123,290 E	Representative rock chip sample, dump of prospect pit; fractured and crushed hornblende trachyte porphyry, limonite after disseminated pyrite, quartz-sericite alteration and jarosite.	3020 (.088)	> 50.0
2998 (6/8/88)	NW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 6 T4N, R4E 747,850 N 1,122,690 E	Representative rock chip sample of vein exposure in prospect pit, porous cellular gossan, 20-30" wide, with jasper, jarosite, vuggy quartz, alunite and clay.	2200 (.064)	19.2
2999 (6/8/88)	SE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 6 T4N, R4E 747,970 N 1,122,550 E	Representative rock chip sample, dump of prospect pit; soft ochreous limonites and clay from mineralized structure in silicified hornblende trachyte porphyry, oxidized.	864 (.025)	> 50.0
3000 (6/9/88)	SW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 747,750 N 1,123,820 E	Representative rock chip sample, 5 feet down wall of prospect pit; hornblende trachyte porphyry is bleached with propylitic alteration and blocky fractures with goethite Mn oxides.	51	0.6

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
4001 (6/9/88)	NW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 746,670 N 1,123,970 E	Rock chip sample, dump of prospect pit; select sample of mineralized fault zone in hornblende trachyte porphyry and Deadwood hornfels; jaspery gossan with quartz-limonite veinlets; quartz-sericite-clay-alunite alteration.	5710 (.166)	36.5
4002 (6/9/88)	NW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 746,975 N 1,123,905 E	Rock chip sample, dump of prospect pit on mineralized fault; brown brecciated hornblende trachyte porphyry; breccia matrix and veinlets of vuggy quartz and limonites after sulfides; oxidized.	1412 (.041)	4.7
4003 (6/9/88)	NW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 747,460 N 1,124,250 E	Rock chip sample, dump of prospect shaft, hornblende trachyte porphyry with very abundant subhorizontal fractures, quartz veinlets, and disseminated goethite-jarosite after sulfides (5%), now oxidized.	2610 (.076)	4.9
4004 (6/10/88)	NE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 6 T4N, R4E 749,980 N 1,123,405 E	Representative rock chip sample outcrop and wall of prospect cut, hornblende trachyte porphyry, fractured by N40°W fault, weakly disseminated limonite after pyrite on fractures.	43	0.1
4005 (6/10/88)	SE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 6 T4N, R4E 748,145 N 1,123,660 E	Select rock chip sample, dump of prospect pit on fracture zone, hornblende trachyte porphyry, bleached white, quartz-sericite alteration, weak limonites after sulfides; oxidized.	375 (.011)	1.9
4006 (6/10/88)	SE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 6 748,430 N 1,122,830 E	Rock chip sample, dump of prospect adit, strongly fractured hornblende trachyte porphyry; quartz-sericite alteration, pervasive silica, and ca. 5% disseminated py, now oxidized to goethite and jarosite.	1613 (.047)	21.3

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
4007 (6/10/88)	SE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 6 748,400 N 1,127,770 E	Rock chip sample of mineralized material from dump of prospect adit; hornblende trachyte porphyry with quartz-limonite veinlets and quartz-sericite alteration on margin of unaltered stock.	2050 (.059)	18.3
4008 (6/10/88)	NW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 748,055 N 1,124,125 E	Representative rock chip sample, dump of prospect pit; fractured and shattered hornblende trachyte porphyry, bleached white with clay-sericite alteration with goethite-jarosite after disseminated and veinlet sulfides.	87	1.1
4009 (6/10/88)	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 6 T4N, R4E 748,185 N 1,124,615 E	Rock chip sample dump of prospect pit, select sample of mineralized Deadwood quartzite, hornfels and minor hornblende trachyte porphyry; silicified with disseminated pyrite and quartz-sulfide veinlets (oxidized).	163	0.7
4010 (6/10/88)	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 6 T4N, R4E 748,380 N 1,124,800 E	Representative rock chip sample, dump of prospect shaft; hornblende trachyte porphyry; subhorizontal sheeting; silicified with propylitic alteration and disseminated and veinlet pyrite; partly oxidized.	125	0.3
4011 (6/10/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 6 747,880 N 1,125,030 E	Rock chip sample, dump of prospect pit; hornblende trachyte porphyry; crushed with clay-sericite alteration and disseminated and quartz-limonite veinlets after pyrite.	185	1.4
4012 (6/11/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 6 748,060 N 1,125,725 E	Representative sample from dump of prospect pit; hornblende trachyte porphyry; strong propylitic alteration and stockworks quartz veinlets; about 3 to 5% disseminated pyrite, oxidized to goethite and jarosite.	254	4.5

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Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
4013 (6/11/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 6 748,075 N 1,125,665 E	Same as above, but different prospect pit	486 (.014)	0.9
4014 (6/11/88)	NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 747,775 N 1,124,800 E	High graded rock chip sample from dump of prospect pit; hornblende trachyte porphyry, strongly sheared and fractured; strong clay-sericite alteration and limonites after sulfides.	611 (.018)	5.1
4015 (6/11/88)	NW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 746,715 N 1,124,600 E	Representative rock chip sample dump of prospect pit in mineralized breccia; fragments of hornblende trachyte porphyry in a limonite-quartz matrix; quartz-sericite alteration.	3030 (.088)	> 50.0
4016 (6/11/88)	SW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 746,135 N 1,124,445 E	Select rock chip sample of mineralized fault breccia, dump of prospect pit; hornblende trachyte porphyry is sheared and brecciated, bleached, quartz-sericite alteration; jaspery silica alteration, with limonite in breccia matrix.	1042 (.030)	21.5
4017 (6/12/88)	SW $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 745,595 N 1,124,410 E	Select sample gossanous rock from dump of prospect pit; sheared Deadwood hornfels; siltstone and dolomitic siltstone, jaspery silica alteration with gossanous blebs.	1775 (.051)	17.9
4018 (6/12/88)	SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 745,555 N 1,124,995 E	Select sample, mineralized rock from dump of prospect trench; hornblende trachyte porphyry shear zone with clay-sericite alteration and many limonite veinlets, some jaspery silica; possible fault.	1059 (.031)	3.6

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
4019 (6/13/88)	SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 745,700 N 1,119,600 E	High grade mineralized rock chip sample, dump of adit; adit in weakly altered hornblende trachyte porphyry; sample is limonite-rich jasper with gossan blebs and bands; probable fault zone.	693 (.020)	> 50.0
4020 (6/13/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 12 T4N, R3E 744,700 N 1,119,435 E	High grade rock chip sample, dump of prospect shaft; hornblende trachyte porphyry, strongly fractured with subhorizontal sheeting; limonite veinlets and weak pervasive silicification, oxidized.	19	20.8
4021 (6/13/88)	SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 1 T4N, R3E 745,800 N 1,119,900 E	High grade rock chip sample, dump of prospect shaft, prominent fissure vein 1' wide cuts hornblende trachyte porphyry; vein is jaspery silica and gossan.	441	> 50.0
4022 (6/13/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 7 T4N, R4E 744,235 N 1,121,690 E	Representative rock chip sample from blocks at portal of prospect adit; Deadwood quartzite heavily impregnated with limonites, bands of dark red brown jaspery silica interlayered with spongy gossan bands.	8	18.2
4023 (6/14/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 4 T4N, R4E 747,700 N 1,135,780 E	Representative rock chip sample, dump of prospect trench; brown altered Deadwood quartzite; brecciated with jaspery silica alteration and gossanous bands of ochreous limonite.	2032 (.059)	27.7
4024 (6/14/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 4 T4N, R4E 747,635 N 1,136,050 E	Representative rock chip sample, dump of prospect pit; brown altered quartzite and dolomitic sandstone of the Cambrian Deadwood formation; jaspery alteration with blebs and bands of gossanous limonites.	25	1.5

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
4025 (6/14/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 4 T4N, R4E 747,700 N 1,135,940 E	Representative rock chip sample of blocks lying on dump of prospect pit; brown ferruginous dolomitic sandstone and quartzite of the Deadwood formation; red brown jaspery silica alteration with blebs of ocherous gossan.	6460 (.187)	> 50.0
4026 (6/14/88)	SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 4 T4N, R4E 747,895 N 1,135,670 E	Representative rock chip sample, dump of caved shaft; yellow-brown altered Deadwood hornfels and quartzite; weak jaspery silica alteration, with gossanous blebs and layers.	356 (.010)	11.2
4027 (6/14/88)	SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 4 T4N, R4E 748,035 N 1,135,210 E	Representative rock chip sample, dump of prospect cut; yellow-brown ferruginous dolomitic sandstone and quartzite of the Deadwood formation; patches of jaspery silica alteration, with gossanous layers; some breccia with jaspery matrix.	2750 (.08)	32.3
4028 (6/14/88)	SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 745,300 N 1,124,835 E	Select rock chip sample of mineralized fault zone, dump of prospect adit; hornblende trachyte porphyry fractured, brecciated and bleached with abundant limonite veinlets.	839 (.024)	7.2
4029 (6/15/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 7 T4N, R4E 744,770 N 1,123,515 E	High grade rock chip sample of mineralized rock from dump of prospect pit; sheared and bleached dolomitic siltstone from Deadwood hornfels; weak silicification and a little limonite after sulfide; oxidized.	50	28.0
4030 (6/15/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 7 T4N, R4E 744,655 N 1,123,585 E	High grade rock chip sample from dump of prospect trench; sheared and fractured Deadwood hornfels and hornblende trachyte porphyry, weak silicification, bleached, clay-sericite alteration, strong limonite after sulfides; oxidized.	1081 (.031)	25.0

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
4031 (6/15/88)	NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 7 T4N, R4E 744,700 N 1,125,555 E	Representative rock chip sample, dump of prospect pit; hornblende trachyte porphyry, crushed and fractured along fault zone, bleached white, quartz-sericite-clay alteration; limonite along fractures; oxidized.	76	1.2
4032 (6/15/88)	NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 7 T4N, R4E 744,550 N 1,125,720 E	Representative rock chip sample, dump of prospect pit; buff colored breccia, fragments of bleached silicified hornblende trachyte porphyry in a limonite matrix; pervasive silica alteration; oxidized.	371 (.011)	3.2
4033 (6/15/88)	NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 7 T4N, R4E 744,280 N 1,127,670 E	Representative rock chip sample, dump of prospect pit; mineralized breccia, bleached altered fragments of quartz trachyte porphyry and hornblende trachyte porphyry in a gossanous limonite matrix; abundant limonite oxidized.	724 (.021)	7.6
4034 (6/15/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 7 T4N, R4E 743,860 N 1,123,870 E	Select rock chip sample, dump of prospect pit; mineralized breccia, Deadwood hornfels, dark red limonites and clays; brecciated and sheared; oxidized; may be Golden Crest structure.	9	1.2
4035 (6/15/88)	NE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 7 T4N, R4E 744,145 N 1,123,100 E	Select rock chip sample, dump of prospect pit. Shattered and sheared hornblende trachyte porphyry; bleached; clay-sericite alteration, limonite after sulfides on fractures and matrix to tectonic breccia; oxidized.	< 5	1.3
4036 (6/15/88)	NE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 8 T4N, R4E 744,350 N 1,127,640 E	Representative rock chip sample, dump of prospect. Brecciated siltstone and quartzite of Deadwood formation; pervasive jaspery silica alteration; abundant limonites after sulfides.	319	3

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
4037 (6/24/88)	NE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 8 T4N, R4E 744,610 N 1,127,735 E	Representative rock chip sample, dump of prospect adit. Bleached recrystallized quartzite of Deadwood formation; strong quartz-sericite altered hornblende trachyte porphyry; disseminated sulfide. mzl.	100	3.9
4038 (6/25/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 8 T4N, R4E 744,325 N 1,127,100 E	Representative rock chip sample dump of prospect adit; mineralized breccia near contact with Tqtp; fragments of trachyte porphyry in a siliceous matrix of ground up trachyte and disseminated sulfides; completely oxidized; gossanous.	856 (.025)	4.5
4039 (6/25/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 8 T4N, R4E 744,290 N 1,127,340 E	Representative rock chip sample, dump of prospect pit. Mineralized and recrystallized Deadwood quartzite; fractured with vuggy and disseminated sulfides; partly oxidized, silicified.	76	2.8
4040 (6/25/88)	NE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 8 T4N, R4E 744,465 N 1,127,450 E	Representative rock chip sample, dump of prospect adit; hornblende trachyte porphyry, fractured with disseminated pyrite, oxidized.	176	10.4
4041 (6/25/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 8 T4N, R4E 744,000 N 1,127,215 E	Representative rock chip sample, large blocks in prospect pit; mainly Deadwood quartzite, fractured, brecciated and laced with limonite; also hornblende trachyte porphyry; all altered and mineralized with disseminated sulfides.	880 (.025)	11.6
4042 (6/25/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 8 T4N, R4E 743,895 N 1,127,040 E	Representative rock chip sample, exposure in prospect cut; mineralized Deadwood quartzite; brecciated recrystallized, jaspery silica; abundant gossanous limonite.	3450 (.100)	15.9

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
4043 (6/25/88)	SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 5 T4N, R4E 744,900 N 1,128,370 E	Representative rock chip sample, dump of prospect adit; fine to medium grained granular hornblende trachyte porphyry; sericitic alteration and disseminated pyrite.	58	1.4
4044 (6/26/88)	SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 5 T4N, R4E 745,095 N 1,128,095 E	Representative rock chip sample, blocks in dump of prospect cut; pale gray mineralized trachyte porphyry; jarositic limonites after disseminated pyrite.	223	0.7
4045 (6/26/88)	SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 5 T4N, R4E 744,970 N 1,128,305 E	Representative chip sample mineralized outcrop of breccia; fragments of Precambrian schists. Deadwood quartzite and trachyte porphyry in a matrix of quartz, jarosite and tuff, strong sericitic alteration.	46	2.1
4046 (6/26/88)	SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 5 T4N, R4E 744,990 N 1,128,340 E	Representative chip sample of outcrop in cut, mineralized breccia; fragments of Deadwood quartzite, Precambrian schist, trachyte porphyry, in a matrix of quartzite, jarosite and adularia.	83	1.6
4047 (6/26/88)	SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 5 T4N, R4E 745,825 N 1,128,320 E	Select rock chip sample of gossanous material in prospect trench; reddish and yellow-brown jasperoid and gossan along fault zone cutting mineralized Cambrian Deadwood hornfels; strong mineralization.	960 (.028)	1.4
4048 (6/26/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 8 T4N, R4E 744,590 N 1,128,620 E	Select sample of "ore" from stockpile on dump; chips of gossanous Deadwood hornfels; ocherous brown limonite; nodular replacement of dolomite	1206 (.035)	28.3

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
4049 (6/26/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 8 T4N, R4E 744,375 N 1,128,565 E	Representative rock chip sample, dump of prospect adit; Gossanous Deadwood hornfels and quartzite brecciated and sheard, probably near fault; replacement of dolomite beds.	533 (.016)	36.4
4050 (6/26/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 8 T4N, R4E 744,705 N 1,128,580 E	Representative rock chip sample from blocks at mouth of prospect adit; mineralized Deadwood hornfels and quartzite; gossanous replacement of carbonate beds. Green cu oxide after chalcocite.	124	2.8
4051 (6/28/88)	NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 7 T4N, R4E 744,270 N 1,125,810 E	Representative rock chip sample, blocks in prospect pit; Deadwood quartzite, fractured with veinlets of limonite after sulfides; 3-5 vol. % sulfides.	78	6.6
4052 (6/29/88)	SW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 754,750 N 1,118,125 E	Representative chip sample dump of prospect adit; oxidized mineralized Deadwood quartzite with minor dolomite, with clots and blebs of gossanous limonites.	323 (.010)	3.5
4053 (6/29/88)	SW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 754,455 N 1,118,325 E	Slightly higraded chip sample,dump of prospect adit; very weakly mineralized Deadwood quartzite and hornfels; mainly diopsidic calc-silicate hornfels with weak limonites after sulfides.	44	0.3
4054 (6/29/88)	SW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 754,230 N 1,118,340 E	Chip sample of gossanous material stockpiled at dump of prospect adit; mineralized Deadwood hornfels, strong sulfide mineralization.	425 (.013)	0.7

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Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
4055 (6/29/88)	SW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 754,090 N 1,118,270 E	High grade chip sample dump of prospect adit; Deadwood quartzite and hornfels; weakly mineralized with disseminated sulfides, now oxidized.	283	1.8
4056 (6/29/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 755,165 N 1,118,260 E	Representative chip sample, dump of prospect adit, weakly mineralized Deadwood hornfels, mainly dolomitic siltstone with a little limonite on fractures.	20	0.4
4057 (6/29/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 755,590 N 1,118,025 E	Representative chip sample, dump of prospect pit; weakly mineralized Deadwood quartzite with red and ocherous limonites in quartzite matrix; in contact with altered and mineralized porphyry.	20	0.4
4058 (6/29/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 755,800 N 1,118,245 E	High grade sample of mineralized Deadwood from dump of prospect adit; Deadwood hornfels, largely dolomitic siltstone, largely unaltered but local gossanous replacement of dolomite.	1351 (.039)	8.7
4059 (6/29/88)	NW $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36 T5N, R3E 755,930 N 1,118,260 E	Rock chip sample dump of prospect adit, representative of mineralized material, Deadwood hornfels and quartzite, heavy replacement and impregnation with limonites after sulfides.	7600 (.218)	2.0
4060 (6/29/88)	SW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 7 T4N, R4E 756,265 N 1,118,265 E	Rock chip sample, select mineralized material from dump of prospect pit; Deadwood hornfels, some siltstone beds replaced by gossanous limonites.	183	1.7

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PROJECT: GILT EDGE AREA, MAPPING AND RECON.

Rock Chip Samples collected by R.L. Nielsen, November - December 1987, April - June 1988

SAMPLE NUMBER	LOCATION	SAMPLE DESCRIPTION	Au ppb (oz./ton)	Ag ppm
4061 (6/30/88)	SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 746,060 N 1,125,930 E	Representative rock chip sample of exposure in cut for 40'. Mineralized and brecciated Deadwood hornfels, hydrothermal breccia and disseminated pyrite. Fragments of Deadwood quartzite and hornblende trachyte porphyry in a quartz pyrite matrix.	251	3.9
4062 (6/30/88)	SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 6 T4N, R4E 745,400 N 1,125,790 E	Rock chip sample 50 feet along cut; bedrock poorly exposed. Shaley part of Deadwood hornfels; very strongly fractured and heavily impregnated with jarosite; strong clay alteration.	501 (.015)	2.4
4063 (7/1/88)	NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 8 T4N, R4E 744,230 N 1,129,080 E	Representative chip sample, dump of prospect adit; Deadwood quartzite, heavily impregnated with limonite after sulfides, some gossanous pods and layers.	32	2.4

